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**TITLE:** Tissue colonization in broiler chickens after oral challenge with Salmonella Heidelberg field strains

**Abstract Body:** A high prevalence of Salmonella Heidelberg has been reported in broiler farms in southern Brazil, reflecting an increasing number of carcasses contaminated at slaughter. This study aimed to determine the potential tissue colonization of S. Heidelberg field strains in broilers. Two S. Heidelberg strains (BRM 42033 and BRM 53672) isolated from broiler houses in southern Brazil were selected based on different antimicrobial resistance and XbaI-pulsed-field gel electrophoresis patterns. Day-old SPF White Leghorn chicks were inoculated with $10^5$ CFU of BRM 42033 or $10^6$ CFU of BRM 53672 by oral gavage, separated in two experimental groups according to each strain, and housed in air-filtered wire-mesh floor isolator chambers. Feed and water were provided ad libitum, and mortality and clinical signs of diseases were daily monitored. Between 10 to 12 broilers from each group were randomly selected, euthanized and necropsied at days 5, 12, 19 and 26 after challenge, and tissues were aseptically removed for Salmonella analyses. Cecal content was subjected to quantitative analysis in brilliant green agar supplemented with 40 mg/mL of novobiocin and 30 mg/mL of streptomycin + 15 mg/mL of gentamycin for BRM 42033 or 50 mg/mL of nalidixic acid for BRM 53672 for selective plate counting. Qualitative analysis was carried out in liver, spleen and cecal tonsils. Salmonella $\log_{10}$ CFU/g measured in cecal content at each necropsy was subjected to an analysis of variance pondered by the inverse of the variance of each S. Heidelberg strain for the model containing the effects of strain, days after challenge, and the interaction strains x days. Fisher exact test was used to compare qualitative results for each strain on each necropsy. Mortality, detected from days 2 up to 8 after challenge, was higher in chicks challenged with BRM 42033 (10/52, 19.2%) than BRM 53672 (2/50, 4%). BRM 42033 showed higher cecal colonization in all evaluated days compared with BRM 53672 ($p \leq 0.05$). At 26 days after challenge, strain BRM 42033 and BRM 53672 showed S. Heidelberg levels of 5.08 ± 1.06 and 2.10 ± 2.42 $\log_{10}$ CFU/g in the cecal content, respectively. Strain BRM 42033 also showed higher number of positive spleens at days 5, 12 and 19; livers at days 5 and 12; and cecal tonsils at days 12, 19 and 26 after challenge ($p \leq 0.05$). Although strains showed differences in colonization potential, the effective colonization of tissues by S. Heidelberg highlights broilers as potential sources of contamination at slaughter and the need for control measures at farms.

**KEYWORDS:** salmonellosis, poultry, food safety.

**CURRENT CATEGORY:** Immunology, Health and Disease

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